



# UNITED STATES PATENT AND TRADEMARK OFFICE

cel

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/849,266	05/19/2004	Jeffrey M. Zachan	051933-1130	6634
24504	7590	08/24/2005	EXAMINER	
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 100 GALLERIA PARKWAY, NW STE 1750 ATLANTA, GA 30339-5948			COX, CASSANDRA F	
			ART UNIT	PAPER NUMBER
			2816	

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/849,266

Applicant(s)

ZACHAN ET AL.

Examiner

Cassandra Cox

Art Unit

2816

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 8-13 and 25-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 14, 15 and 18-24 is/are rejected.
- 7) ☒ Claim(s) 5, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/23/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

Group I, directed to claims 1-7 and 14-24, shows a phase locked loop including a switching module as shown in Figure 3A.

Group II, directed to claims 8-13 and 25-28, shows a phase locked loop including a square root module as shown in Figure 4A.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. During a telephone conversation with David Rodack on July 22, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-7 and 14-24. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-13 and 25-28 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 6-7, 14-15, and 18-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Fukuda (U.S. Patent No. 5,831,483).

In reference to claim 14, Fukuda discloses in Figure 1 a phase-locked loop comprising: a current generating device (5) configured to generate a control current; and a switching module (7) configured to vary the control current in proportion to the inverse of  $N$  squared, wherein  $N$  is a ratio of an output frequency ( $f_o$ ) of the PLL to a reference frequency ( $f_r$ ) of the PLL. This is seen to be true because by varying  $c_p$  the output frequency ( $f_o$ ) is changed which is related to the inverse of  $N$  squared, since  $N$  is related to the output frequency ( $f_o$ ). The same applies to claims 1, 6, and 21 wherein the circuit comprises a detector (4, 5) whose gain is varied, see column 3, lines 50-54.

In reference to claim 15, Fukuda discloses in Figure 2 that the current generating device (5) includes at least one current source ( $P3$ ,  $N2$ ) and at least one switch ( $N4$ ) that controls the flow through the at least one current source ( $P3$ ,  $N2$ ), see column 5, lines 13-19. The same applies to claims 2-3.

In reference to claim 18, Fukuda discloses in Figure 1 wherein the current generating device is a charge pump (5). The same applies to claim 4.

In reference to claim 19, Fukuda discloses in Figure 1, the circuit further including a loop filter (6), an oscillator (1), a divide-by- $N$  module (2, this is seen to be true because the divider is used to divide the output frequency ( $f_o$ ) by a variable ( $N$ ) wherein the output ( $f_v$ ) is equal to the reference frequency ( $f_r$ ) causing the circuit to lock. So, if  $f_v = f_r = f_o/N$ , then  $N = f_o/f_r$ , and a phase/frequency detection device (4), wherein the loop

Art Unit: 2816

filter (6) is disposed between the charge pump (5) and the oscillator (1), the divide-by-N module (2) is disposed between the oscillator (1) and the phase/frequency device (4), the phase /frequency device (4) is coupled to the charge pump (5). The same applies to claim 23 wherein the detector is equivalent to the phase/frequency device 4 and the charge pump 5 combined.

In reference to claim 22, Fukuda discloses in Figure 1 that the detector (4,5) includes one of a phase detector and a frequency detector. The same applies to claim 7.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-2, 6-7, 14, 18, and 21-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Davis et al. (U.S. Patent No. 6,624,707).

In reference to claim 14, Davis discloses in Figure 3 a phase-locked loop comprising: a current generating device (16) configured to generate a control current (see column 4, lines 16-19); and a switching module (20) configured to vary the control current in proportion to the inverse of N squared, wherein N is a ratio of an output frequency (output of VCO 12) of the PLL to a reference frequency (17) of the PLL. This is seen to be true because by varying the tuning voltage (58) the output frequency is changed which is related to the inverse of N squared, since N is related to the output frequency. The same applies to claims 1, 2, 6, and 21 wherein the circuit comprises a detector (16) whose gain is varied, see column 7, lines 35-38.

In reference to claim 18, Davis discloses in column 4, lines 16-19 wherein the current generating device is a charge pump (included in the phase detector).

In reference to claim 22, Davis discloses in Figure 1 that the detector (16) includes one of a phase detector and a frequency detector. The same applies to claim 7.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (U.S. Patent No. 5,831,483).

In reference to claim 20, Fukuda discloses all the limitations of the claim as mentioned above with respect to base claim 14 and intervening claims 18-19, except, Fukuda does not say that the charge pump (5), the loop filter (6), the oscillator (1), the divide-by-N module (2), and the phase/frequency detection device (4) are disposed on a single semiconductor chip. However, it would have been obvious to one skilled in the art at the time of the invention that all of those elements could have been disposed on a single chip for the advantage of saving space and thereby reducing costs. The same applies to claim 24.

***Allowable Subject Matter***

9. Claims 5 and 16-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: Claims 5 and 16 would be allowable because the closest prior art of record fails to disclose a circuit as shown in Figure 3A wherein the switching module (250) is configured to activate the at least one switch (364) based on a value of N that is programmed into the circuit in combination with the rest of the limitations of the base claims and any intervening claims. Claim 17 would be allowable because the closest prior art of record fails to disclose a circuit as shown in Figure 3A wherein the switching module (250) is configured to activate the at least one switch (364) based on a threshold range of N in combination with the rest of the limitations of the base claims and any intervening claims.

***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cassandra Cox whose telephone number is 571-272-1741. The examiner can normally be reached on Monday-Thursday from 7:00 AM to 4:30 PM and on alternate Fridays from 7:30 AM to 4:00 PM.



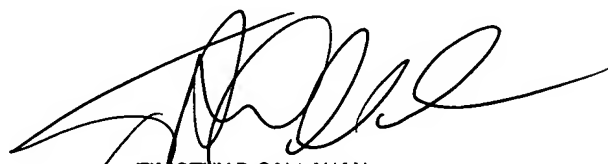
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CC



August 19, 2005



TIMOTHY P. CALLAHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800